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1973

A Recreation Study of the Sullivan Lake Area in the Colville National Forest of Washington



A Cooperative Study Between
Washington State University,
Department of Forestry and Range Management
and the
United States Forest Service

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A RECREATION STUDY OF THE
SULLIVAN LAKE AREA IN THE
COLVILLE NATIONAL FOREST OF WASHINGTON

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ABSTRACT

Between June 11 and September 7, 1971, Washington State University, cooperating with the Colville National Forest, conducted a comprehensive recreation study of the Sullivan Lake area in northeastern Washington. Direct observation, mechanical counters, focused interviews and nine questionnaires were used to collect information concerning traffic flow, campsite utilization, trail and backcountry usage. User characteristics and preferences were also studied.

A total use of 42,278 visitor days was recorded during the study. This figure represents a 3.1 percent increase over the entire 1970 use figure calculated by the U.S. Forest Service and suggests that recreational use of the Sullivan Lake area may be increasing more rapidly than other comparable wildland areas in the Pacific Northwest.

Traffic generated by local residents on personal business and traffic associated with the Sullivan Lake Ranger Station accounted for the majority of incoming traffic to the area. Recreational traffic represented 45 percent of the total. Fifty-two percent of this recreational traffic came from Spokane County. Fifty-one percent of all recreation vehicles contained persons who were visiting the area for the first time. These figures suggest that Sullivan Lake is in the process of being discovered and that the majority of people discovering the area are from Spokane County.

Sullivan Lake was found to serve as a destination area for weekend family camping. Ninety-four percent of all camping groups were families with 86 percent staying at least two nights. Nearly half stayed exactly two nights and 88 percent of these selected Friday and Saturday evenings.

The high use season was much shorter than the 87 day study period. Peak use occurred from mid-July through the third week in August but even during this period use was strongly weather dependent.

The lake was found to be the primary attraction for most recreationists. Campers favored lake campgrounds and campsites closest to the lake. The daily charge for camping was not found to be a significant factor in campground selection.

INTRODUCTION AND STUDY JUSTIFICATION

The recreational use of Sullivan Lake has increased slightly more than 70 percent between 1960 and 1970 (7). Actually, this growth rate is considerably less than the average for all other recreation areas administered by the U.S. Forest Service in Washington (2). For the nation as a whole, recreational use is projected to reach two and one-half times its 1965 level by the year 2000 (1). If we project the growth rate experienced on the Sullivan Lake area for the 1960-1970 period, it would seem that this Bureau of Outdoor Recreation projection would be extremely conservative. By the year 2000, such a projection would give Sullivan Lake 204,290 visitor use days annually. This is nearly five times the use recorded during 1970. There is, however, a great deal of danger in projecting use trends in outdoor recreation. We may be rapidly approaching the inflection point of the recreation growth curve, i.e., where future growth will increase but at a decreasing rate. We have no way of knowing this until it is history unless, through planning, measures are developed to restrict growth. This makes long range projections practically meaningless. At Sullivan Lake, we can predict that, unless severe restrictions are imposed to curb expanded growth, recreational use will continue to increase.

The U.S. Forest Service and the Pend Oreille County Planning Council are, in fact, encouraging this growth. The Planning Council believes that development of the full recreation potential of the Sullivan Lake area is needed to maintain and expand the economies of nearby communities. They predict that recreation will be the largest industry of Pend Oreille County in future years (5).

The U.S. Forest Service has steadily developed the Sullivan Lake area as their funds permit. In 1967, an 11 site campground was developed at the Millpond site; in 1969, a three and one-half mile trail was completed around the east side of Sullivan Lake; and in 1970, special use permits for eight summer home tracts, five resort cottages and a concession facility were terminated. This last action was an integral step in the Forest Service plan to greatly enlarge the existing campground behind this summer home tract. Ten new units were added to this campground in 1970. The Forest Service has considered a special use permit for a private resort complex consisting of at least ten lodging units, a store providing basic camping and picnicking

supplies, a boat rental and a gas station (7).

Slightly over four-fifths of the 8.13 mile shoreline of Sullivan Lake is too steep and rocky to offer any possibility for recreational development (7). The lands most suited to recreational development lie at the north and south ends of the lake. As pointed out in the recreation management plan for Sullivan Lake, this shoreline limitation is an asset because it precludes any overdevelopment (7). But, it also severely limits recreational development and forces land-base recreation activities to be concentrated at the ends of the lake. Problems associated with overuse and with uses not totally compatible with one another are rapidly developing and can most effectively be avoided by careful selection and planning of use priorities. On lakes with greater potential for shoreline development, these problems can usually be avoided through planning which isolates conflicting uses and disperses users. At Sullivan Lake, expanded use without careful planning could easily cause both the social and biological carrying capacities of the prime sites to be exceeded.

Opportunities for developing a wide diversity of recreational activities at Sullivan Lake are limited. The future development must be based on planning which considers alternative recreation activities and facilities on a hierarchal basis. Public wants and needs, and the environmental impacts of alternative uses are two factors which must be considered in setting this hierarchy.

This cooperative study between the U.S. Forest Service and the Department of Forestry and Range Management at Washington State University represents an attempt to document recreational use of Sullivan Lake as it exists today. It attempts to determine what kinds of people are using the area, where are they coming from, what kinds of experiences are they having, what kinds are they looking for, what kinds of facilities would heighten these experiences and which would detract. Through a combination of personal interviews, questionnaires, direct observation, and check stations established along trails and highways, current use patterns and preferences of users in the area were established. It is hoped that this study will make a significant contribution to the future planning for outdoor recreation in the Sullivan Lake area.

DESCRIPTION OF THE STUDY AREA

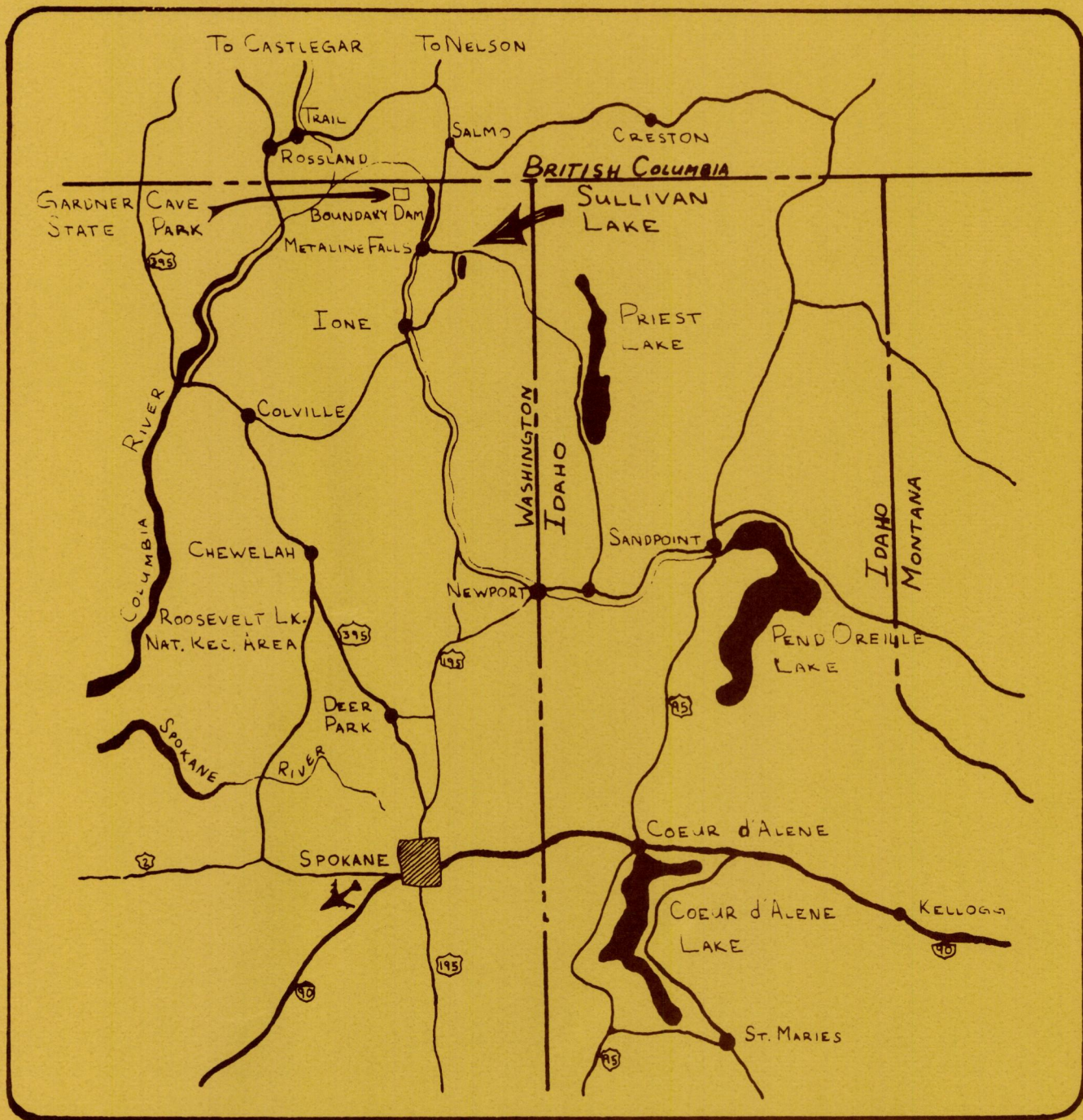
Glacially sculptured Sullivan Lake lies in the heart of the mountainous northeastern corner of the State of Washington (Figure 1, pg. 5). The area serves as a recreation hub in northern Pend Oreille County; attracting users from the major metropolitan centers of Spokane, ninety-five miles to the south, and from the Trail and Nelson British Columbia area, sixty-five miles to the north.

Sullivan Lake is easily accessible from County Highway 31 to the west and in the summer via the Metaline-Nordman Forest Road which connects Sullivan Lake to the Priest Lake recreation area to the east. Because of weather and its distance from major population centers, primary use of the Sullivan Lake area occurs during the summer months. The area offers recreationists a wide variety of activities including fishing, hunting, swimming, water-skiing, boating, backpacking, camping, and sight-seeing. Boundary Dam and Reservoir on the Pend Oreille River, Crawford State Park, Gypsy Ridge and the Pristine Drainage of the South Fork of the Salmo River, within a short drive of Sullivan Lake are additional features which add to the area's overall attractiveness as a destination for summer vacations.

Sullivan Lake is a deep, three and one-half mile long lake fed by Noisy, Sand, Hall and Harvey Creeks. A retention dam at the northwest corner of the lake, operated under permit to the Pend Oreille County Public Utility District No. 1, controls the lake level throughout the year. Less than a mile downstream from the Sullivan Dam, Outlet Creek flows into Sullivan Creek and Millpond, an eighty-two acre reservoir also controlled by a retention dam.

The U.S. Forest Service maintains four developed campgrounds in the immediate area around Sullivan Lake (Figure 2, pg. 6). Spanning the breadth of Sullivan Lake's north shore is the North Sullivan Lake Recreation Complex composed of two campgrounds with thirty-five sites, an airfield and the Sullivan District Headquarters of the U.S. Forest Service (Figure 3, pg. 7). A succession of summer cottages, many with adjoining dock facilities on the lake occupy a bench above the county road which follows the west shoreline

of the lake. Summer homes also occupy tracts at the south end of the lake and on the delta of Hall Creek on the northeast shore. In 1970, a large summer home tract was terminated on the north end of the lake to facilitate greater public access to the water. To the south where Noisy Creek enters Sullivan Lake, a nineteen site campground has been developed (Figure 4, pg. 9). A ten site campground is also maintained at Millpond (Figure 5, pg. 9). The Lake Shore Trail which follows the east side of Sullivan Lake offers one of many hiking opportunities available in the area.



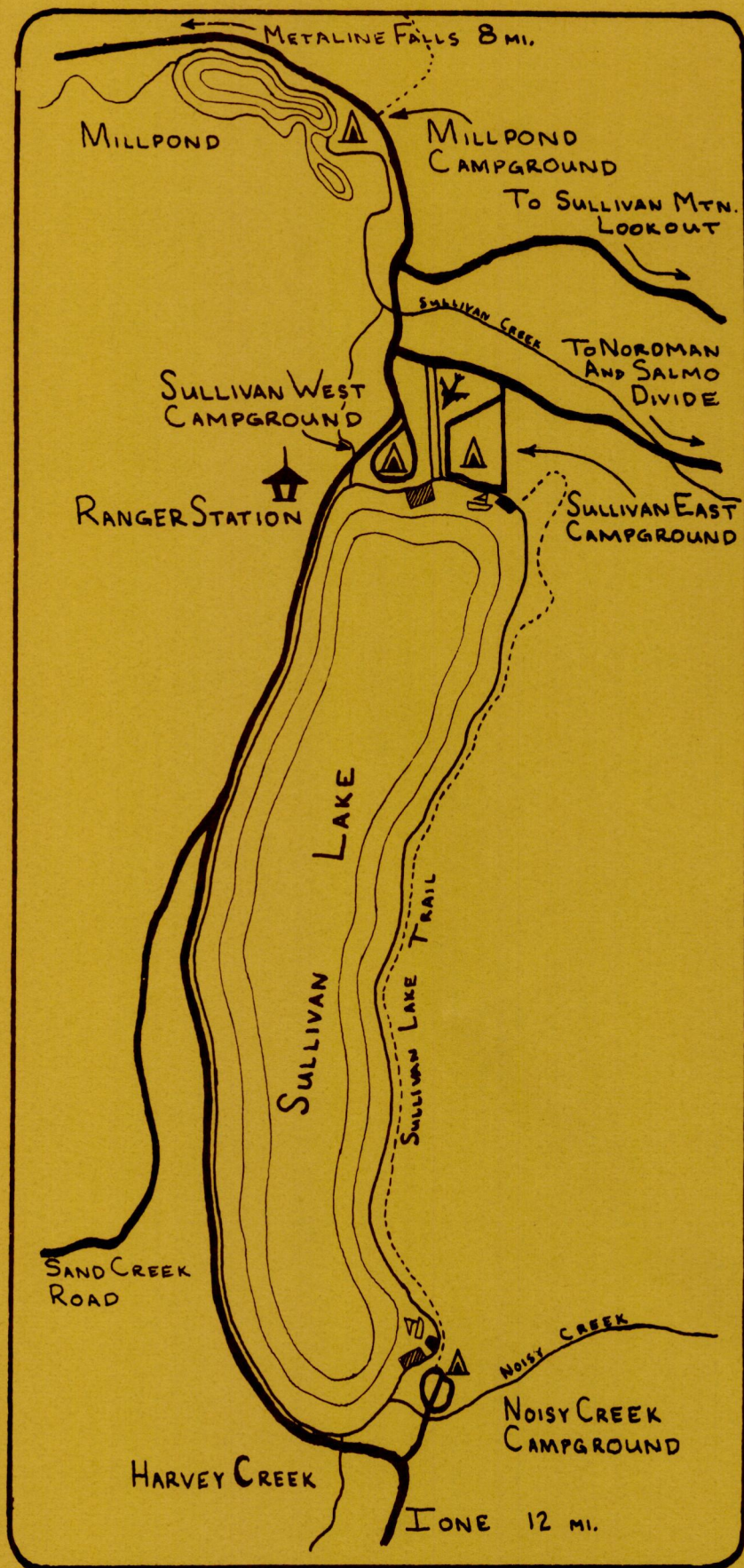
VICINITY MAP SULLIVAN LAKE

FIGURE 1



ROAD MILEAGE FROM SULLIVAN LAKE

COLVILLE	52	MILES
SPOKANE	95	MILES
TRAIL	65	MILES
NELSON	66	MILES



SULLIVAN LAKE PRIMARY STUDY AREA

MILLPOND	82 ACRES
SULLIVAN LAKE	1290 AC.
ELEVATION	2,580 FT.
DEPTH	275 FT.
SHORELINE	8.13 MI.

----- TRAILS
SULLIVAN LK. TRAIL 3.5 MI.

■ BEACHES

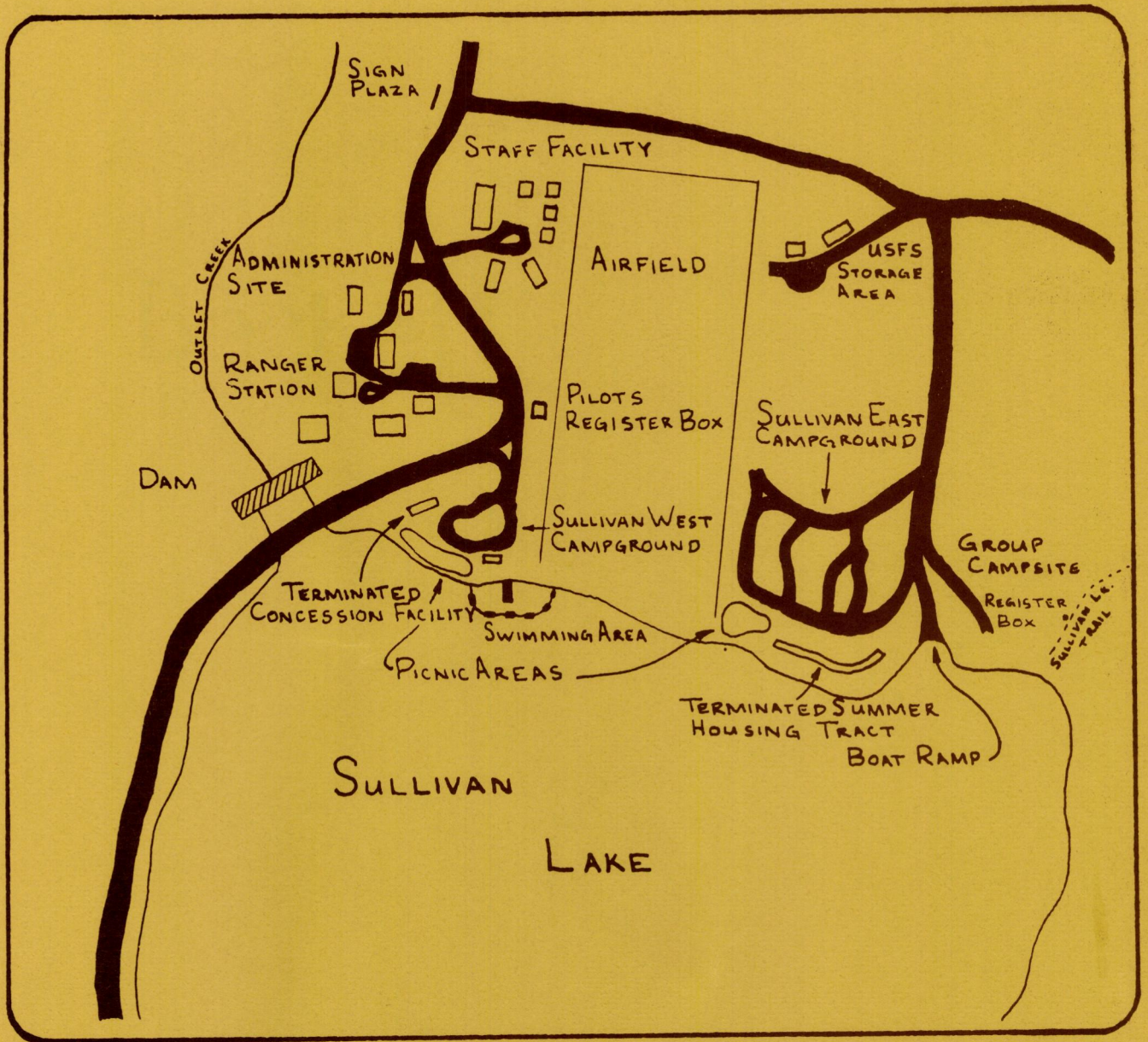
■ ⚓ BOAT RAMPS

* AIRFIELD 17 ACRES

△ CAMPGROUNDS

MILLPOND	10 SITES
SULLIVAN WEST	10 SITES
SULLIVAN EAST	25 SITES
NOISY CREEK	19 SITES

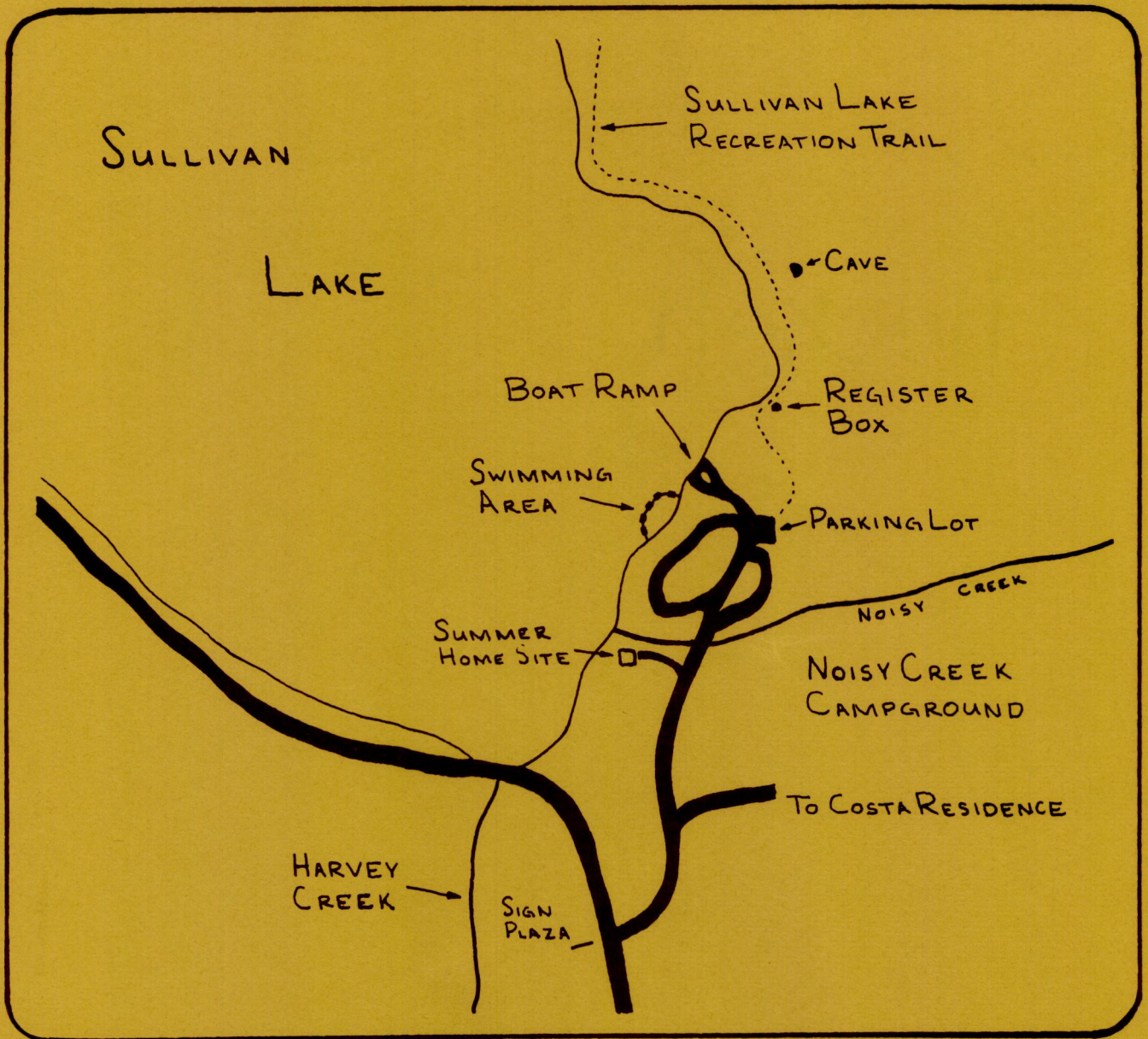
FIGURE 2



NORTH SULLIVAN LAKE
RECREATION COMPLEX

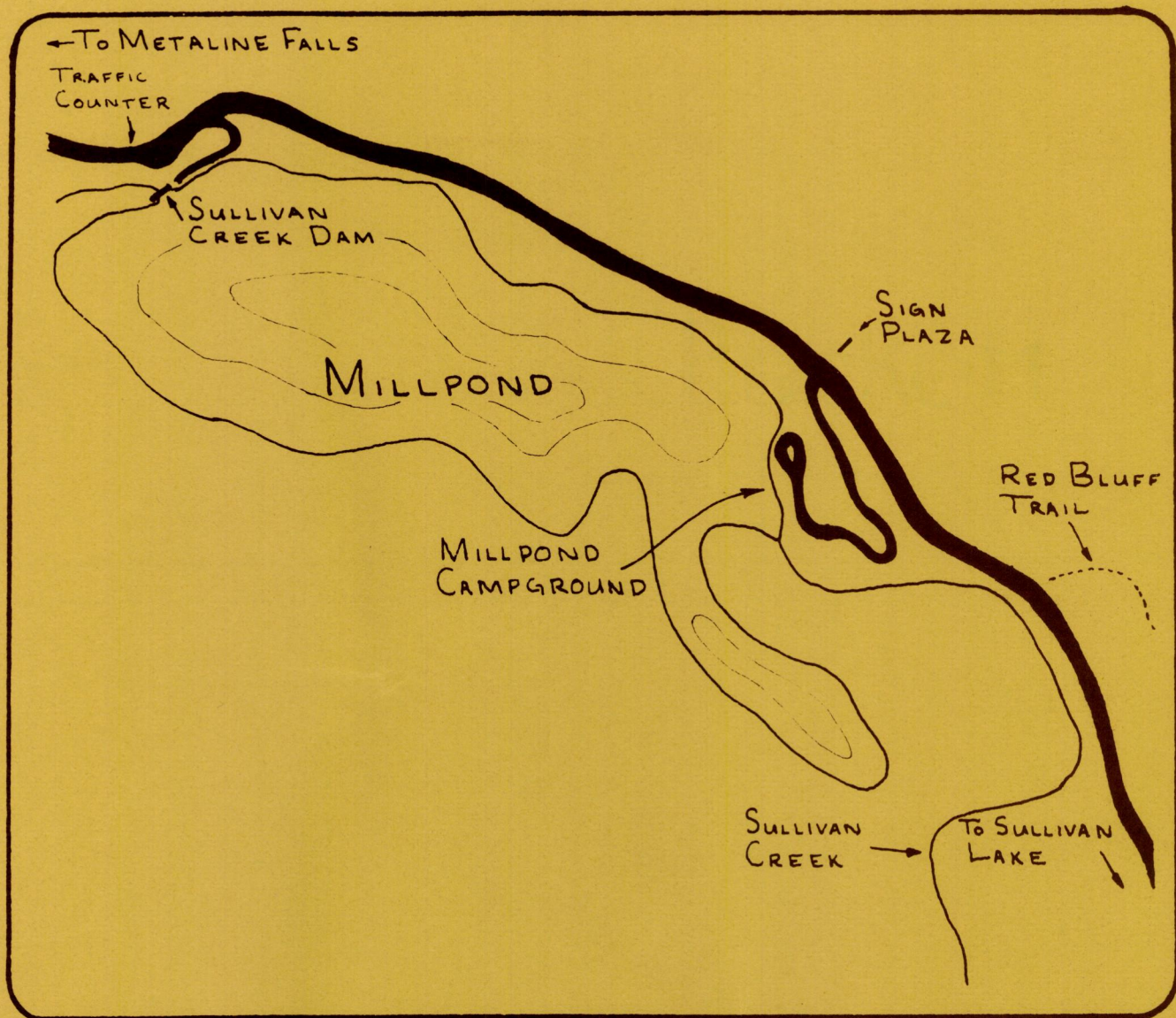
AND

ADMINISTRATIVE SITE
FIGURE 3



SOUTH SULLIVAN LAKE RECREATION COMPLEX

FIGURE 4



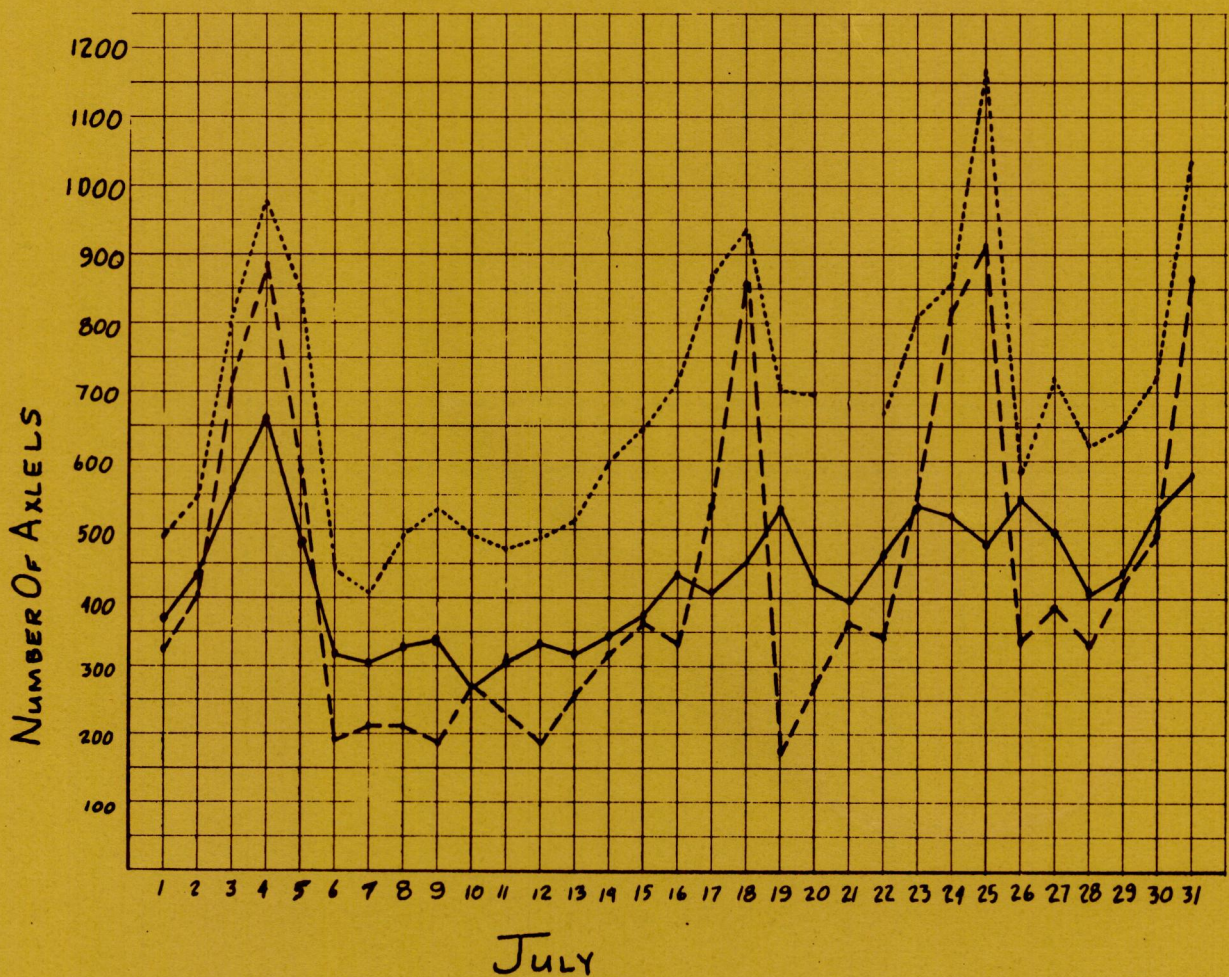
MILLPOND CAMPGROUND

FIGURE 5

JULY TRAFFIC FLOW PATTERN

FIGURE 6A

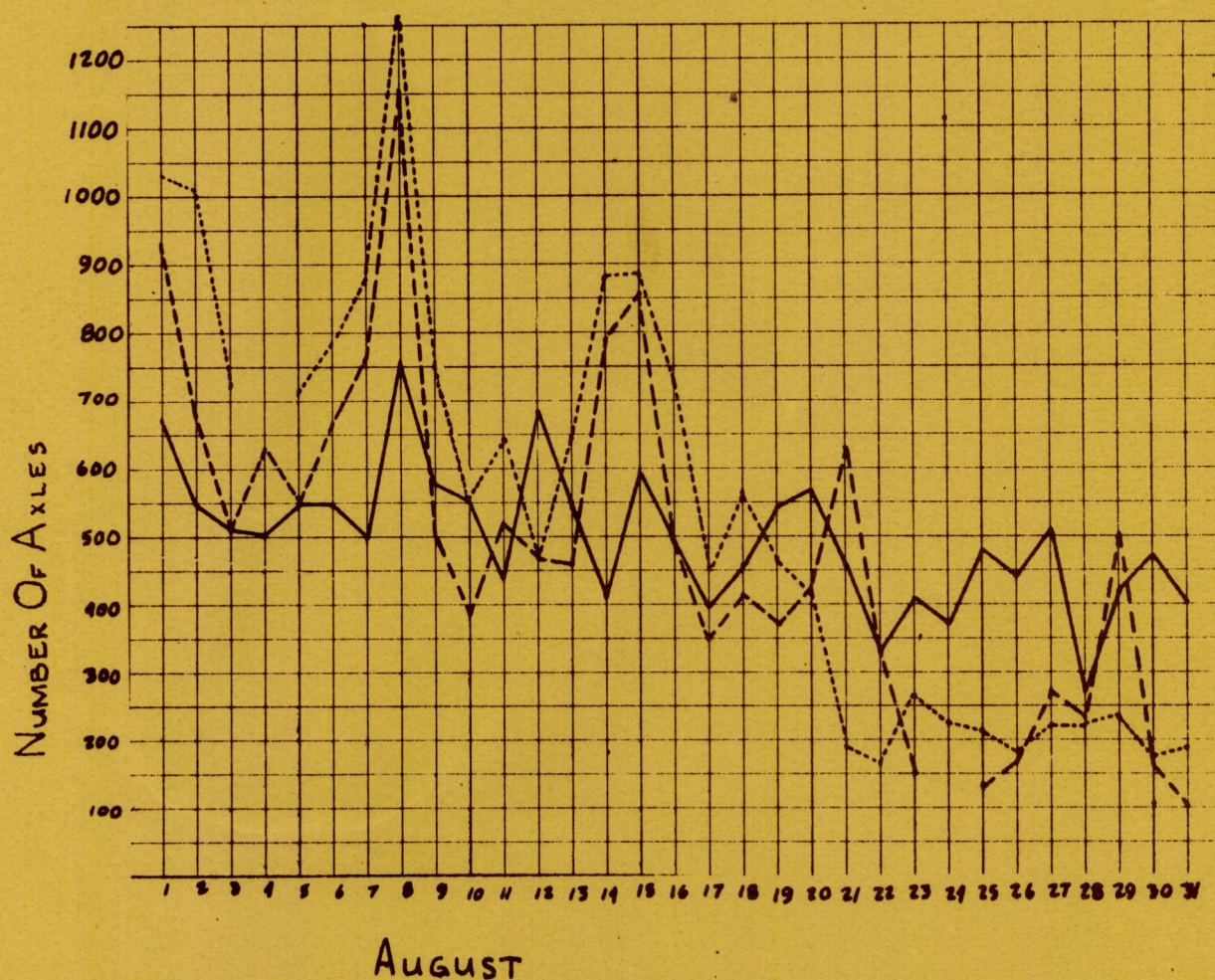
..... MILLPOND ENTRANCE (NORTH)
----- NORTH RECREATION COMPLEX
—— NOISY CREEK ENTRANCE (SOUTH)



AUGUST TRAFFIC FLOW PATTERN

FIGURE 6B

..... MILLPOND ENTRANCE (NORTH)
----- NORTH RECREATION COMPLEX
——— NOISY CREEK ENTRANCE (SOUTH)



ENTRANCE STUDY

OVERALL TRAFFIC ANALYSIS

Between June 21 and September 7, 1971, all traffic entering and leaving the Sullivan Lake area by the primary access routes was monitored daily using pneumatic traffic counters. These were installed west of the entrance to Millpond Campground on the Metaline-Nordman Road and south of the entrance to Noisy Creek Campground on the county road leading to the community of Ione. Check stations were also established at these points and on randomly selected days incoming traffic was halted and the occupants of each vehicle interviewed. The data collected at these check stations made it possible to compare overall traffic and recreational traffic flow at these two locations for average weekdays and average weekend days. An average weekday was defined as any consecutive twenty-four hour period between Monday at 8:00 a.m. and Friday noon and an average weekend day as any consecutive twenty-four hour period between Friday noon and Monday at 8:00 a.m. The decision to compare data on these two kinds of days was based on the existing use pattern established in the Sullivan Lake area. On any two consecutive twenty-four hour periods between Monday at 8:00 a.m. and Friday noon the traffic flow was comparable. The same was true for weekend days.

The Metaline-Nordman Road (the north entrance) received the heaviest total use on both weekdays and weekend days. On the average weekday it received 21 percent more use (by axle) than did the Ione-Sullivan Lake Road (the south entrance). On the average weekend day the Metaline-Nordman Road received 49 percent more use. However, nighttime use was greater on the Ione-Sullivan Lake Road on both weekday evenings and weekend day evenings (TABLE 1).

Nighttime traffic flow, defined as traffic recorded between the hours of dusk and 8:00 a.m., at both access points was greater on average weekdays than on weekend days. This is a bit of a surprise since there were more vehicles in the area weekend days as evidenced by both site utilization and traffic flow records. This probably reflects a drop in the general nonrecreation use such as early morning local commuter traffic and Forest Service traffic on weekend days. It also suggests that recreationists do not do much driving into or out of the area during these nighttime hours.

TABLE 1

TOTAL TRAFFIC FLOW BY AXLE

Average Weekday			Average Weekend Day		
Millpond Entrance Station			Millpond Entrance Station		
Daytime Hours	Nighttime Hours	Total	Daytime Hours	Nighttime Hours	Total
424	89	513	644	35	679
Noisy Creek Entrance Station			Noisy Creek Entrance Station		
Daytime Hours	Nighttime Hours	Total	Daytime Hours	Nighttime Hours	Total
327	96	423	411	44	455

RECREATION TRAFFIC ANALYSIS

Forty-five percent of all traffic entering the Sullivan Lake area during the daylight hours was recreational. Although, the Metaline-Nordman Road experiences heavier traffic generally, the Ione-Sullivan Lake Road receives proportionally more recreational use. On average weekdays, 40 percent of all incoming daytime traffic along the Ione-Sullivan Lake Road was recreational, as compared to 26 percent along the Metaline-Nordman Road. On weekend days this figure rose to 57 percent at the south entrance and 51 percent at the north entrance (TABLE 2A and 2B).

Proportionally more recreation vehicles in the passenger car class were noted entering via the north entrance. Many of these passenger cars were occupied by local residents entering the area for day use or they were occupied by persons already established in area campgrounds. Sixty percent of all these returnees were encountered at the north entrance station. The Ione-Sullivan Lake Road appears to be the principle initial approach route for the long-term recreationists (those staying at least one night) where the Metaline-Nordman Road is more heavily used by the local recreationists and by long-term recreationists for side trips from Sullivan Lake. When one considers that fifty-two percent of all users in the Sullivan Lake area were from Spokane County and that many others originate from other locations to the south, one would expect the Ione-Sullivan Lake Road to be the principle initial approach route. The traffic counter data seems to support

this pattern (Figure 6A and 6B). The traffic flow on the access road to the North Sullivan Recreation Complex correlates with the peaks in flow on the Metaline-Nordman Road. The traffic flow pattern on the Ione-Sullivan Lake Road is much less erratic. The Metaline-Nordman Road seems to handle the peaks of the recreational traffic much of which is comprised of day use and side trips of established campers.

TABLE 2A
ENTERING RECREATION TRAFFIC ANALYSIS
BY ENTRANCE STATION

North Entrance Station				South Entrance Station			
Average Weekday				Average Weekday			
Total Daytime Axles	Total Recreation Axles	Recreation As % of Total		Total Daytime Axles	Total Recreation Axles	Recreation As % of Total	
187	48	26%		136	55	40%	
Average Weekend Day				Average Weekend Day			
Total Daytime Axles	Total Recreation Axles	Recreation As % of Total		Total Daytime Axles	Total Recreation Axles	Recreation As % of Total	
274	141	51%		223	126	57%	
Total	461	189	41%	Total	359	181	50%

TABLE 2B
ENTERING RECREATION TRAFFIC
ANALYSIS BY DAY

Average Weekend Day			Average Weekday				
North Entrance			North Entrance				
Total Daytime <u>Axles</u>	Total Recreation <u>Axles</u>	Recreation As % of <u>Total</u>	Total Daytime <u>Axle</u>	Total Recreation <u>Axle</u>	Recreation As % of <u>Total</u>		
274	141	51%	187	48	26%		
South Entrance			South Entrance				
Total Daytime <u>Axles</u>	Total Recreation <u>Axles</u>	Recreation As % of <u>Total</u>	Total Daytime <u>Axles</u>	Total Recreation <u>Axles</u>	Recreation As % of <u>Total</u>		
223	126	57%	136	55	40%		
Total	497	267	54%	Total	323	103	32%

RECREATION VEHICLE ANALYSIS

Because of the small numbers of vehicles encountered in certain types of recreation vehicle classes, an analysis of the entering recreation vehicles either by entrance or by day cannot be justified. The percentage of the total incoming recreational vehicles by class is presented in TABLE 3.

TABLE 3

RECREATION VEHICLE ANALYSIS

Type of Recreation Vehicle	% Of Total Recreation Traffic
Passenger Car	56.1%
Camper	19.1%
Pickup Truck	8.6%
Motorcycle	5.3%
Bus or Van	4.4%
Boat Trailer	2.9%
Travel Trailer	2.8%
<u>Tent Camper</u>	<u>.8%</u>

RECREATION USER ANALYSIS

Persons entering the Sullivan Lake area for recreational purposes were asked their hometown as part of the check station interview. The U.S. Forest Service collected similar data during a 1968 user survey. Between 1968 and 1971 there has been a notable change in the origin of Sullivan Lake recreation clientele (TABLE 4). In 1971, 52 percent of all users were from Spokane County as compared to 36 percent in 1968. In 1971, 11 percent of all users were from Canada as compared to 28 percent in 1968. It is estimated that the

recreational use of Sullivan Lake has increased 7.7 percent (a minimum figure) between 1968-1970. An increase of this magnitude suggests that the changes in the proportion of users is real and not simply a result of increased use by Spokane County residents. There simply were fewer Canadians using the Sullivan Lake area in 1971 than there were in 1968.

A total of 42,278 visitor use days for the June 1-September 6 study period was recorded. This represents a 3.1 percent increase over the 1970 figure calculated by the U.S. Forest Service (7). However, the 1970 figure represents use for the entire season. If the entire 1971 season were compared to this figure, the percentage of increase would be considerably higher.

TABLE 4

RECREATION USER ORIGIN ANALYSIS

	June 21-Sept. 16 1971	U.S. Forest Service 1968
Spokane County	51.9%	36.0%
Pend Oreille Counties	18.7%	11.0%
Other Washington Counties		
East of the Cascades	9.7%	13.0%
West of the Cascades	4.0%	5.0%
Out of State	4.9%	7.0%
Canada	10.8%	28.0%

	Millpond Entrance 1971	Noisy Creek Entrance 1971
Spokane County	25.0%	70.0%
Pend Oreille County	26.3%	13.6%
Other Washington Counties		
East of the Cascades	10.8%	9.0%
West of the Cascades	8.2%	1.4%
Out of State	5.4%	4.6%
Canada	24.3%	1.4%

CAMPERS STAY THE NIGHT BEFORE THEIR ARRIVAL AT SULLIVAN LAKE

At the check stations all incoming recreational groups were asked where they had spent the previous night. Seventy-nine percent stated that they had spent the previous evening at home--home being defined as their place of residence or a place where they were engaged in non-recreational activities (e.g., a business meeting in Spokane). Twenty-five percent of those who had not spent the previous evening at home, had stayed within the Sullivan Lake study area and were returning to their camps. Eight percent had spent the previous night at the Lone Campground; 5 percent at campgrounds or the homes of friends in the Spokane area; 4 percent at the Crescent Lake Campground; and 4 percent at various campgrounds in the Little Pend Oreille Lakes area. The remaining persons spent the previous evening at twenty-three different campgrounds and towns in a wide radius around Sullivan Lake.

USER'S ANTICIPATED AND ACTUAL LENGTH OF STAY IN THE SULLIVAN LAKE AREA

Incoming recreational groups were asked to estimate their intended length of stay in the Sullivan Lake area during the check station interview (TABLE 5). The largest proportion of campers (28%) estimated they would spend a single night in the area. The campground utilization survey indicated that nearly half of all campers stayed exactly two nights. Many campers intending to spend only a single night actually spent at least two nights. This may serve as an indirect measure of user satisfaction in the Sullivan Lake area.

TABLE 5
USER'S ANTICIPATED LENGTH OF STAY IN THE
SULLIVAN LAKE AREA

Day Use	35%
One Night	28%
Two Nights	17%
Three Nights or More	20%

MISCELLANEOUS DATA FROM CHECK STATION INTERVIEWS

The average group size for recreationists entering the Sullivan Lake area was 3.84.

The predominant recreational activities of most recreationists were water oriented. Nearly 51 percent of those entering the area indicated that swimming, fishing, or boating would be their predominant recreation pursuit (TABLE 6).

More than 16 percent of all recreation groups entering the Sullivan Lake area possessed a boat. Eight percent brought or rode motorcycles or trailbikes to the area.

TABLE 6

<u>USER'S DOMINANT RECREATIONAL PURSUIT</u>	
Swimming	24.8%
Fishing	19.4%
Camping	14.5%
Relaxing	10.5%
Hiking	7.9%
Boating	6.6%

CAMPGROUND UTILIZATION STUDY

The use of the sixty-four campsites in the four developed campgrounds within the Sullivan Lake study area was recorded each evening from June 11 until September 6, 1971. These four campgrounds could have accommodated 5,568 group nights of camping during the time of the study. Actual use during the study period was 2,512 group nights or 45 percent utilization (TABLES 7 and 8).

As a commercial enterprise, such a utilization record would probably constitute a marginal business. Lapage (3) arbitrarily defined a successful commercial campground as one that had a use of more than 50 percent of its capacity during the previous season of operation. By commercial standards, Sullivan West and Sullivan East campgrounds with 50 percent and 49 percent utilization respectively would be marginal. Certainly by commercial standards expanding the size of any of the campgrounds in the study area would be difficult to justify economically.

However, the high use season at Sullivan Lake is much shorter than the eighty-seven day study period. If July and August were considered as the use season, total utilization increases to fifty-four percent.

Another important factor to consider is the daily utilization rate. On weekends (Friday and Saturday evenings) during July and August, 69 percent of all available sites in the four campgrounds were occupied. On eighteen days or 29 percent of the time during July and August, at least 75 percent of the sites were occupied; on nine days or 15 percent of the time at least 90 percent were occupied and on three days or 5 percent of the time the campgrounds were filled to capacity.

TABLE 7

CAMPSITE UTILIZATION
WEST SULLIVAN CAMPGROUND

Site #	June (19 nights)		July (31 nights)		August (31 nights)		September (6 nights)	
	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation
1	4	21%	19	61%	19	61%	3	50%
16	8	42%	13	42%	24	77%	0	0%
19	13	68%	17	55%	16	52%	3	50%
27	13	68%	24	77%	28	90%	3	50%
30	1	5%	12	39%	20	65%	0	0%
31	1	5%	18	58%	20	65%	0	0%
32	2	10%	17	55%	21	68%	0	0%
33	0	0%	15	48%	22	71%	0	0%
34	2	10%	11	35%	18	58%	0	0%
35	1	5%	12	39%	24	77%	0	0%
Total 10	45	24%	158	51%	212	68%	9	15%

CAMPSITE UTILIZATION
NOISY CREEK CAMPGROUND

Site #	June (19 nights)		July (31 nights)		August (31 nights)		September (6 nights)	
	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation
1	2	10%	22	71%	19	61%	0	0%
2	3	16%	9	29%	15	48%	1	17%
3	2	10%	16	51%	14	45%	0	0%
4	0	0%	9	29%	5	16%	3	50%
5	7	37%	11	35%	12	39%	3	50%
6	1	5%	14	45%	4	13%	3	50%
7	2	10%	12	39%	9	29%	3	50%
8	5	26%	14	45%	15	48%	3	50%
9	7	37%	20	65%	23	74%	4	67%
10	2	10%	14	45%	15	48%	0	0%
11	12	63%	24	77%	30	97%	4	67%
12	2	10%	13	42%	13	42%	3	50%
13	8	42%	19	61%	24	77%	5	83%
14	1	5%	10	32%	15	48%	4	67%
15	4	21%	20	65%	25	80%	3	50%
16	2	10%	9	29%	14	45%	4	67%
17	3	16%	15	48%	26	83%	5	83%
18	0	0%	9	29%	13	42%	4	67%
19	1	5%	15	48%	21	68%	3	50%
Total 19	64	18%	275	47%	312	53%	55	48%

TABLE 7 Cont'd.

CAMPSITE UTILIZATION
MILLPOND CAMPGROUND

Site #	June (19 nights)		July (31 nights)		August (31 nights)		September (6 nights)	
	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation
1	3	16%	6	19%	7	23%	3	50%
2	2	10%	11	35%	6	19%	1	17%
3	6	32%	12	39%	13	42%	4	67%
4	15	79%	14	45%	23	74%	3	50%
5	5	26%	12	39%	8	26%	0	0%
6	9	47%	19	61%	19	61%	6	100%
7	0	0%	6	19%	4	13%	0	0%
8	6	32%	7	22%	6	19%	0	0%
9	8	42%	9	29%	11	35%	5	83%
10	4	21%	9	29%	7	23%	0	0%
Total 10	58	31%	105	34%	104	34%	22	37%

CAMPSITE UTILIZATION
EAST SULLIVAN CAMPGROUND

Site #	June (19 nights)		July (31 nights)		August (31 nights)		September (6 nights)	
	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation
1	1	5%	23	74%	24	77%	0	0%
2	2	10%	28	90%	20	65%	3	50%
3	1	5%	22	71%	21	68%	1	17%
16	4	21%	26	84%	22	71%	2	33%
17	7	37%	28	90%	23	74%	1	17%
18	3	16%	23	74%	22	71%	3	50%
19	7	37%	25	81%	21	68%	3	50%
20	2	10%	27	87%	21	68%	1	17%
21	1	5%	20	65%	23	74%	4	67%
22	3	16%	17	55%	23	74%	1	17%
23	1	5%	25	81%	21	68%	6	100%
24	8	42%	23	74%	22	71%	3	50%
25	4	21%	29	94%	28	90%	3	50%
26	0	0%	21	68%	18	58%	3	50%
27	2	10%	22	71%	21	68%	3	50%
28	1	5%	8	26%	16	52%	1	17%
29	1	5%	12	39%	16	52%	1	17%
30	1	5%	9	29%	19	61%	3	50%
31	0	0%	10	32%	20	65%	1	17%
32	0	0%	10	32%	18	58%	0	0%
33	0	0%	13	42%	14	45%	2	33%
34	0	0%	9	29%	19	61%	3	50%
35	0	0%	10	32%	16	52%	3	50%
36	0	0%	17	55%	15	48%	2	33%
37	5	26%	18	58%	25	81%	4	67%
Total 25	54	11%	475	61%	508	66%	56	37%

TABLE 8

CAMPSITE UTILIZATION
ALL CAMPGROUNDS

Campground	No. of Sites	June (19 nights)		July (31 nights)		August (31 nights)	
		Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation
Millpond	10	58	31%	105	34%	104	34%
Sullivan East	25	54	11%	475	61%	508	61%
Sullivan West	10	45	24%	158	51%	212	68%
Noisy Creek	19	64	18%	275	47%	312	53%
All campgrounds	64	221	18%	1013	51%	1136	57%

Campground	No. of Sites	September (6 nights)		June 19-Sept. 6 (87 nights)	
		Nights Occupied	% Utili- zation	Nights Occupied	% Utili- zation
Millpond	10	22	37%	289	33%
Sullivan East	25	56	37%	1093	50%
Sullivan West	10	9	15%	424	49%
Noisy Creek	19	55	48%	706	43%
All campgrounds	64	142	37%	2512	45%

CAMPER SURVEY

During the study, representatives of four camping parties were interviewed each evening. Campsites in Millpond, Sullivan East, and Noisy Creek campgrounds were chosen by random drawing. Interviews were not conducted at the Sullivan West Campground where trailers were prohibited. A total of 307 interviews were conducted.

CAMPING GROUP SIZE

Ninety-four percent of all camping parties were family groups. The average group size was 4.4 persons (TABLE 9).

TABLE 9

CAMPING GROUP SIZE

Campground	Party Size						
	1	2	3	4	5-6	7-9	10+
	%*	%*	%*	%*	%*	%*	%*
Millpond	0%	22%	8%	31%	22%	14%	3%
Sullivan East	0%	26%	9%	22%	30%	9%	4%
Noisy Creek	0%	22%	11%	27%	27%	11%	2%
All campgrounds	0%	23%	9%	29%	27%	9%	3%

*Percent of respective campground totals.

CAMPER'S EXPERIENCE AT SULLIVAN LAKE

Fifty-one percent of all the camping parties interviewed were visiting Sullivan Lake for the first time (TABLE 10). The data suggests that past experience has little influence on preference for a particular campground. The Sullivan East Campground was preferred by 20 percent of those with ten years or more experience in the area while second year campers seemed to prefer Millpond and Noisy Creek Campgrounds. The local residents of Ione, Metaline Falls appeared to concentrate their use in the Sullivan East

Campground. This may partially explain the preference for this area by those clientele with the greatest experience (TABLE 10).

TABLE 10
CAMPER'S PAST EXPERIENCE
AT SULLIVAN LAKE

Campground	Past Experience					
	First Time %*	1st Year %*	2nd Year %*	3-5 Years %*	5-9 Years %*	10+ Years %*
Millpond	54%	03%	15%	08%	08%	13%
Sullivan East	50%	03%	07%	14%	06%	20%
Noisy Creek	52%	06%	14%	18%	03%	07%
All Campgrounds	51%	04%	11%	15%	05%	14%

*Percent of respective campground totals.

LENGTH OF STAY

The campgrounds in the Sullivan Lake area served as a destination for many campers. Eighty-six percent of all campers stay in the area for at least two nights (TABLE 11). The mode for length of stay was two nights which correlates with the high use the area experiences on weekends. Combining user origin, length of stay and site utilization, it appears that the Sullivan Lake area is becoming a favored weekend destination area for the people of Spokane County.

TABLE 11
CAMPER'S LENGTH OF STAY

Campground	Length of Stay									
	1		2		3-5		6-9		10+	
	Nights	%*	Nights	%*	Nights	%*	Nights	%*	Nights	%*
Millpond	17%		51%		20%		06%		06%	
Sullivan East	09%		39%		28%		09%		15%	
Noisy Creek	20%		43%		28%		05%		04%	
All Campgrounds	14%		42%		27%		07%		10%	

*Percent of respective campground totals.

HOW CAMPERS LEARN OF SULLIVAN LAKE

Most new campers (61%) come to Sullivan Lake on the advice of friends (TABLE 12). Such positive word-of-mouth advertising might also serve as an indirect measure of user satisfaction.

TABLE 12

HOW CAMPERS LEARN OF SULLIVAN LAKE

Campground	Source			
	Friends %*	Accident %*	Maps-Brochures Directories %*	Inquiry %*
Millpond	44%	15%	37%	04%
Sullivan East	61%	15%	21%	03%
Noisy Creek	65%	20%	14%	01%
All Campgrounds	61%	17%	20%	02%

GOLDEN EAGLE OWNERSHIP

Only 31 percent of all campers in the Sullivan Lake study area possessed the Golden Eagle Passport (TABLE 13). This seems low compared to the findings of surveys conducted in other federal permit areas. In a recent national parks study, as many as 70 percent of all campers were found to have purchased Golden Eagle Passports (6). Golden Eagle ownership seems particularly low when one considers that Sullivan Lake is primarily a destination area where the average camping party stays 3.5 days. However, in 1971 the cost of the Golden Eagle Passport increased from \$7.00 to \$10.00. Many of the parties interviewed liked the idea of the Golden Eagle but didn't believe they would be camping in federal permit areas enough times during the season to merit its purchase.

Millpond was the only developed campground of the four in the study area which did not require daily use fees. It also was the least used (TABLE 8). Either people were unaware of the free use at the Millpond Campground or they did not consider cost a deciding element in campground selection. Cost was not mentioned by any of the groups that were interviewed as a factor in campground selection at Sullivan Lake.

TABLE 13

GOLDEN EAGLE OWNERSHIP

Campground	Passport Ownership	
	% Yes *	% No *
Millpond	26%	74%
Sullivan East	40%	60%
Noisy Creek	21%	79%
All Campgrounds	31%	69%

*Percent of respective campground totals.

CAMPGROUND AND CAMPSITE SELECTION

The most commonly mentioned factor in campground selection at Sullivan Lake was closeness to the lake. Twenty-six percent of all the camping groups interviewed mentioned this factor (TABLE 14). Water is a primary focal point for outdoor recreation (4). At Sullivan Lake, more than half of all recreationists considered swimming, fishing, or boating as their primary recreation pursuit (TABLE 6).

Campsite selection seemed to be largely based on utility. Nearly 40 percent of all campers mentioned either proximity of drinking water or restrooms as their primary site selection criteria. Site availability was the second most mentioned criteria for selection. It appears that a campsite close to the lake, restrooms and potable water supply would satisfy most of the camping clientele at Sullivan Lake (TABLE 14).

TABLE 14

CAMPGROUND AND CAMPSITE SELECTION
FACTORS

Campground Selection Factors		Campsite Selection Factors	
Factor	% of Groups Mentioning*	Factor	% of Groups Mentioning*
1. Close to lake	26%	1. Close to Drinking water	28%
2. Privacy	19%	2. Only site available	12%
3. Recommended by friends	18%	3. Large	11%
4. First encountered	15%	4. Close to restroom	10%
5. Swimming	08%	5. Shade	09%
6. Clean	07%	6. Privacy	08%
7. Only one available	07%	7. Level	06%
8. Fishing	03%	8. Swimming	05%
9. Room for trailer	03%	9. Room for trailer	05%
10. Level	01%	10. Recommended by friends	04%
		11. First encountered	03%
		12. Boating	01%

* These percentages do not total 100% because many groups mentioned more than one factor.

CAMPER'S POSSESSION OF PETS AND SPECIAL RECREATION EQUIPMENT

More than a third of all camping parties at Sullivan Lake bring the family pet along with them (TABLE 15). In other federal camping areas which cater to the general public, as high as 55 percent of all campers travel with pets (6). Possession of pets can result in conflicts between owners and non-owners. Negative comments relating to pets, particularly dogs, were voiced by nearly one-fifth of all campers. Most people felt these problems could be solved by enforcing leash laws and by prohibiting pets in certain areas, particularly the swimming beach.

Thirteen percent of all camping groups possessed either a motorcycle or a trailbike (TABLE 15). These vehicles were also the focus of most of the negative comments of campers. Nearly one-third of all campers mentioned that either the noise or the danger, particularly to children in the campground, was the most serious problem in the area. Most of these people felt quite strongly that the noise level and speed of motorcycles and trailbikes ought to be regulated.

TABLE 15

POSSESSION OF PETS AND SPECIAL
RECREATION EQUIPMENT

Campground					
	Pet %*	Bicycle %*	Motorcycle %*	Boat %*	Television, Record Player, Tape Recorder %*
Millpond	35%	03%	03%	38%	19%
Sullivan East	28%	10%	15%	29%	10%
Noisy Creek	46%	0%	13%	28%	02%
All Campgrounds	37%	06%	13%	35%	09%

*Percent of respective campground totals.

CAMPER'S FAMILIARITY WITH AREA ATTRACTIONS

Camper's lack of familiarity with the many recreation opportunities in the area could be expected as over half were visiting the area for the first time. Twenty-three percent of the campers interviewed had not heard of Crawford State Park and the Gardner Cave Area (TABLE 16). Another 39 percent had heard of this area but had not seen it. Many were not sure just how to get to it. The majority of campers were totally unaware of the recreation road leading to the Salmo-Divide and the Salmo Lookout. Few knew of the many hiking trails available in the area.

TABLE 16

CAMPER FAMILIARITY WITH AREA ATTRACTIONS

Area Attractions	Never Heard of %*	Heard of %*	Seen %*
Boundary Dam and Power House	15%	33%	52%
Crawford State Park	23%	38%	39%
Pewee Falls	75%	09%	16%
Box Canyon Dam	14%	15%	71%
Salmo River	41%	36%	23%
Sasquatch	12%	88%	0%

*Percent of all campers interviewed.

CAMPER PREFERENCE STUDY

One portion of the nightly campground interview was devoted to camper preference for specific campground facilities and services (TABLES 17-21). The data is based on the responses of 307 campers.

TABLE 17

PREFERENCE FOR FIREPLACE DESIGN

Ground Level Grates	53%
Doesn't Matter	18%
Metal or Stone Warming Circles	14%
Elevated Charcoal Grills	8%
Waist-high Fireplaces	4%
Other	3%

TABLE 18

PREFERENCE FOR CAMPGROUND ROAD SURFACING

Gravel	45%
Paved	35%
Doesn't Matter	17%
Oil	3%

TABLE 19

PREFERENCE FOR PARKING RAMP DESIGN

Back-in Type	53%
Pull-through Type	26%
Doesn't Matter	21%
Other	0%

TABLE 20

PREFERENCE FOR CAMPSITE SPACING

Just Right*	91%
Too Close Together*	7%
Too Far Apart*	2%

*In reference to existing conditions.

TABLE 21

PREFERENCE FOR EVENING CAMPFIRE PROGRAMS

Would Attend (interested)	52%
Might Attend (depend on subject)	31%
Would Not Attend (not interested)	17%

CAMPER ECONOMIC ACTIVITY

Campers were also questioned concerning their purchase and need for purchase of food, gas and other camping supplies. The data is based on the response of 307 campers randomly selected over the study period.

FOOD AND CAMPING SUPPLIES

Slightly more than a third of all campers purchased grocery and food items on their way to Sullivan Lake. Of this one-third, 21 percent purchased these items in Metaline Falls. Ten percent purchased these items in either Metaline, Ione, or Tiger. Food was the most commonly purchased item followed by alcoholic beverages, ice, and fishing equipment.

Forty percent of all camping groups indicated they would need to buy more food before returning home. Nearly 95 percent of these indicated this food would be purchased in nearby towns.

Forty percent of the campers interviewed stated that they had forgotten to bring certain essential small non-food items. Seventy-nine percent of these people stated that they probably would buy these items if they were available at Sullivan Lake.

GASOLINE

Thirty-one percent of the camping parties interviewed purchased their last tank of gasoline in either Metaline, Ione, or Tiger. Forty-six percent stated they would need to purchase more gasoline within fifty miles of Sullivan Lake.

RESPONSE TO A GENERAL STORE AT SULLIVAN LAKE

Fifty-five percent of all camping groups felt that the convenience of some type of store at Sullivan Lake would add to their overall enjoyment of the area. A general store with basic grocery items was favored by 86 percent of these people while 11 percent believed that a gasoline station should be the top priority.

SULLIVAN LAKE RECREATION TRAIL

A three and one-half mile scenic trail which follows the east shoreline of Sullivan Lake and connects the North and South Recreation Complexes was completed in 1969 (Figure 2, pg. 6). The trail is managed as a hiking trail with fences and angled gates at either end to discourage motor vehicles and packstock. Between June 22 and September 6, 1971 self-registration stations were placed inside the gates at both ends of the trail. Hiking groups were asked to fill out a brief questionnaire upon completion of their hike.

Questionnaires from 250 parties were completed during the study period. However, through camper interviews and personal observations at the self-registration stations, it was discovered that many people did not bother to fill out the trail questionnaire. The trail quite possibly received 50 percent more use than our data shows. The bias introduced by the large portion of nonrespondents precluded any generalization to the whole trail user population. Below is the data and opinions from those trail users who were concerned enough to fill out questionnaires.

Based on completed trail questionnaires, eight hundred seventy-five persons used the Sullivan Lake Recreation Trail during the study period. The actual use figure may be closer to 2000. The average group size was 3.4 excluding two large organized groups of seventeen and fourteen persons each. The most common group size was two. Although overall use (including camping, swimming, and boating) of the North Recreation Complex was far greater than the use of the South Recreation Complex, trail use was greater from the south trailhead. Fifty-six percent of all hiking groups initiated their hike from the south entrance. One reason for this could have been the signing. At the South Recreation Complex, signs identifying the lake trail were placed in the central parking area. At the North Recreation Complex, the only signs identifying the trail were located at the end of the group camping area which was removed from the major areas of user concentration. Word-of-mouth or accident were probably the predominant ways most people learned of the trail at the north end.

Sixty-six percent of all the groups using the Sullivan Lake trail hiked between the hours of 9:00 a.m. and 3:00 p.m. (TABLE 22). The highest use was from 9:00 a.m. till noon. Thirty-eight percent of all parties hiked during this time.

TABLE 22

PERIOD OF THE DAY FOR HIKING

Trail Head	Time of Day				
	6:00 AM	9:00 AM	12:00	3:00 PM	6:00 PM
	to 9:00 AM %*	to 12:00 %*	to 3:00 PM %*	to 6:00 PM %*	to 9:00 PM %*
North Trail Head	18%	40%	27%	10%	05%
South Trail Head	04%	37%	30%	15%	14%
TOTAL	11%	38%	28%	13%	10%

* Percent of all hiking groups initiating their hike at the respective trail head.

A surprising proportion (19%) of the hiking groups hiked both ways on the trail (TABLE 23). The largest proportion (27%), however, hiked half way and then returned.

TABLE 23

DISTANCE HIKED ON THE SULLIVAN RECREATION TRAIL

Trail Head	Distance Hiked					
	Both Ways	One Way	1/2 Way Out	1 mi. Out	1 Mile	Less Than
	7 mi. %*	3-1/2 mi. %*	& Back 3-1/2 %*	& Back 2 mi. %*	Total %*	1 Mile %*
North Trail Head	22	20	19	19	7	13
South-Trail Head	16	10	34	17	13	11
TOTAL	19	14	27	18	10	12

* Percent of all hiking groups initiating their hike at the respective trail head.

Eighty-five percent of all hiking groups rated the trail as either good or excellent. Eleven percent considered it fair and 4 percent poor. The ratings from hikers that initiated their hike from the north end were generally higher. The reasons for approval of the trail were the wildlife and the variety of scenic views the trail afforded. Those rating the trail as poor did not like the rocks on the pathway or they wished the trail had taken them closer to the lake.

Eighty-two percent of the hiking groups stated that they would use other trails in the area if they were available. When asked to describe trails that they would like to see developed, most people indicated a preference for circular trails, although, point to point trails were also acceptable to the majority. About half of the people preferred trails in the high country and half trails along the streams. A trail length of one to three miles was preferred by 47 percent of all groups while 29 percent preferred longer trails--three to five miles in length.

AIRSTRIP UTILIZATION STUDY

Between June 21 and September 6, forty-two recreation aircraft landed at Sullivan Lake airstrip. On August 6, the Washington Pilot's Association held their annual outing at Sullivan Lake. Five aircraft were involved. Because of the lack of camping sites, this group was forced to camp at Crescent Lake. They were much in favor of a few campsites designed for fly-in groups along the margin of the Sullivan airstrip.

RECREATION ROAD STUDY

The majority of the Forest Service roads within the Sullivan Ranger District are used for recreation purposes. The recreational activity on two such roads was studied: the Sullivan Creek-Salmo Divide Road and the Salmo Mountain Road. Self-registration stations were installed at the end of these two roads and pneumatic traffic counters were installed at strategic points.

One of the traffic counter stations was installed on the Metaline-Nordman Road west of the Pass Creek Junction. Heading northeast away from Sullivan Lake, one could turn southeast remaining on the Metaline-Nordman Road and continue to Priest Lake some thirty miles beyond or one could continue on the Sullivan Creek-Salmo Divide Road. This road dead ends a few miles beyond Salmo Pass. Our second road counter was installed at Gypsy Creek Junction on the Sullivan Creek-Salmo Divide Road.

The average daily traffic flow for the study period (June 21-September 6) at the Gypsy Creek Station was twenty-seven axles. This would be roughly equal to the axle count resulting from the out and back traffic of four passenger cars. However, the traffic flow was extremely erratic. In late June, only six axles were recorded daily. The average weekday count for July and August was approximately twenty-five axles daily. On weekends during this period the average rose to fifty-eight axles daily. Use was highly weather dependent. A daily average of 70 axles was recorded on the weekend of August 14 and 15. This was the highest traffic recorded during the study period. It would be roughly equal to the up and back traffic of 17 two-axle vehicles.

The Pass Creek Station recorded nearly four times the traffic flow of the Gypsy Station. The daily average at Pass Creek was 127 axles; 100 more than Gypsy Creek. Some of this traffic could be attributed to logging operations in the area. However, even on weekends when logging would not have affected the data, a similar use pattern existed. No more than 20 percent of the traffic (1 out of every 5 passenger cars) that was recorded at the Pass Creek Station continued to the Gypsy Creek Station.

The data collected at the self-registration station at the end of the Sullivan Creek-Salmo Divide Road and the Salmo Mountain Lookout Road

indicated that the prevailing recreational activity on these two roads is late morning. Most (70%) were family outings in passenger cars (TABLE 24). Sixty percent of all respondents were from Spokane. Sixteen percent were from Metaline Falls and Ione. Fifty-six percent had driven directly to the area from home.

Seventy-nine percent of the groups using the Sullivan Creek-Salmo Divide Road evaluated it as either good or excellent. The predominant reasons for the high rating were the views and the solitude the road offered. Those rating the road as poor complained of the oil and washouts. Groups using the Salmo Mountain Road evaluated it much lower. This road was being reconstructed during the study period. Ninety percent of the groups believed there was no need for additional roads in the area.

TABLE 24

SALMO RECREATION ROAD USE AND PERIOD

Type of Vehicle	% of Total Use
Passenger Car	52
Pick-up Truck (2 wheel drive)	16
4-wheel Drive Vehicle	26
Motorcycle	6
<hr/>	
Use Period	% of Total
6:00 a.m. - 9:00 a.m.	6
9:00 a.m. - 12:00 noon	45
12:00 noon - 3:00 p.m.	26
3:00 p.m. - 6:00 p.m.	15
6:00 p.m. - 9:00 p.m.	8

BACKCOUNTRY TRAIL STUDY

There are many miles of outstanding backcountry trails within the Sullivan Ranger District. One area, which is gaining in popularity among backpackers, is the drainage of the South Fork of the Salmo River in the far northeastern corner of the district. Certain interest groups believe that the Salmo is suited for inclusion within the wilderness preservation system. The area has been identified by the U.S. Forest Service in their recent Roadless Area study and is presently recognized as a wilderness candidate study area. Formal classification will depend upon further studies by both the U.S. Forest Service and concerned interest groups. The backcountry portion of this study focused on the Salmo Basin.

The principle trailhead for the Salmo area is located about one mile east of Salmo Pass near the end of the Sullivan Creek-Salmo Divide Road. Use was monitored in the area via several self-registration stations. One station was located one-fourth mile down from the trailhead on the Salmo Cutoff Trail (No. 506). Another was placed near a U.S. Forest Service cabin some seven miles further into the area. Other self-registration stations were established on the Salmo Divide Trail (Trail No. 535) which follows the rim of the Salmo Basin to the northeast. No matter which route hikers chose to enter the Salmo, they would have eventually encountered a trail registration station.

Based on the data collected at these registration stations, it was found that 366 persons hiked into the Salmo between July 1 and September 6, 1971. Use was evenly spread throughout this study period (TABLE 25). Sixty percent of the groups responding to the questionnaire indicated that they were in the area for the first time. Only fourteen percent stated that they had been to the area more than twice before. The average party size was 3.6; excluding two large groups of fifteen and thirteen each in August and a group of eleven in September. Nearly half of all registered hikers were males under sixteen years of age.

Approximately one-third of the use was day use only, with 59 percent of the people hiking between five and fifteen miles (TABLE 25). Fifty-eight percent of all registered users were Spokane residents and 70 percent of all

groups drove from their homes to the trailhead. Few people (less than 6%) indicated that they were staying in the developed campgrounds around Sullivan Lake.

Sixty percent of all parties entered the Salmo via the Salmo Cutoff Trail (Trail No. 506) and thirty-six percent via the Salmo Divide Trail (Trail No. 535) at the head of Sullivan Creek. No groups indicated entry from the Priest drainage to the east.

TABLE 25

BACKCOUNTRY TRAIL USE DATA

<u>Use by Month</u>	<u>% of Total Use</u>
July	32
August	42
September	26

<u>Length of Stay</u>	<u>% of Total Users</u>
Day Use	33
1 Night	31
2 Nights	19
3 Nights	8
4 Nights	9

<u>Distance Hiked</u>	<u>% of Total Users</u>
0 - 3 mi.	9
3 - 5 mi.	7
5 - 10 mi.	30
10 - 15 mi.	29
15 - 25 mi.	18
25 - 50 mi.	7

MANAGEMENT IMPLICATIONS

Sullivan Lake receives its greatest recreational use on the weekends of July and August. The short use season is directly related to climate. In spring and fall, recreational use follows the same erratic pattern as does the weather. Even during the peak of the recreation season, the recreational use of Sullivan Lake is extremely weather dependent. Because of this short unpredictable season, the potential for private recreation development seems low.

Most recreation clientele live within 100 miles of Sullivan Lake. The greatest numbers come from Spokane County to the south. Since 1968, the proportion of users from Spokane County has greatly increased. Most of the use is by family groups. The peak use periods are on weekends. Sullivan Lake is primarily a weekend destination area for families of Spokane County.

Water is a focal point for outdoor recreation (4). Half of all recreation users surveyed in this study were attracted to Sullivan Lake by the opportunity to participate in swimming, fishing, or boating activities. One-fourth came primarily for swimming. By 1980, swimming is predicted to be the number one outdoor recreation activity in America (1). Although swimming is already the most popular activity in Sullivan Lake, trends indicate that it will become even more important in the near future. The single most important management objective at Sullivan Lake, from the people point of view, should be to provide quality swimming opportunities. Fishing was found to be the second most popular activity followed by camping which was also strongly water oriented. Optimization of water related recreation opportunities, considering both social and biological carrying capacities, should be a high priority item for future research at Sullivan Lake.

Recreation clientele were, for the most part, satisfied with the current quality and quantity of recreation opportunities in the Sullivan Lake area. However, some day users believed they were being discriminated against, particularly in regards to swimming. Day use parking for the swimming area was located in the campground on the west side of the lake. This design appeared to cause unnecessary traffic and congestion in the campground. Parking sites were limited and they were subject to the same use fee as were

the campsites. The design problem associated with providing opportunities for day use swimming and the problem of determining an equitable fee system for swimming should be solved before further complications arise.

Many people believe that something should be done about motorcycles in the Sullivan Lake area. Not only is the noise disturbing to them but they believe that cycles represent a real safety hazard, particularly to children in the campgrounds. Excessive noise and speed could be controlled by enforcement of existing state and Forest Service laws. An educational program may also be necessary. The public should be reminded of existing laws and they should be made aware of special restrictions such as the closure of specific trails and roads.

The Sullivan Lake airstrip represents a lavish use of prime recreational lands which in the future may lead to either conflict with the other recreation activities or unwarranted restriction of activities which are in greater demand than recreational flying. The airfield conflicts with swimming, boating, and camping; three of the primary reasons people come to Sullivan Lake. Optimization of these water related activities cannot occur in conjunction with the airfield at its present location.

Visitor information services are important to the present recreation clientele using Sullivan Lake. Over half are visiting the area for the first time and effective interpretation at the visitor center would not only increase their awareness of other recreation opportunities in the area but it would also foster a more meaningful experience through an understanding of Sullivan Lake's cultural and natural history. In a destination area for family camping, a visitor center would represent a recreational activity in and of itself. It would compliment the individuals experience and add to his overall satisfaction.

The general store, gasoline station, and resort complex if developed at Sullivan Lake should be separated from the lake and placed in a position behind and visually isolated from the campgrounds and swimming beaches. If placed in the wrong location, development of this kind could conflict with the primary reason most of the present clientele come to Sullivan Lake. If such a development is kept both visually and physically isolated from the predominant water oriented activities offered in the North Sullivan

Recreation Complex, it apparently would add to most of the present users overall satisfaction at the lake.

Sullivan Lake is truly a unique recreation resource. A resource which will only gain in value as demands increase. The management and planning of such an area is not only a challenge but a responsibility which requires a social sensitivity and ecological sense that is not easily developed. It is hoped that this study in some small way contributes to this overall effort.

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